July 2012 Gas Market Events REPORT

AUSTRALIAN ENERGY REGULATOR

Introduction

Under the National Gas Rules (Gas Rules), the AER is required to identify and publish reports on significant price variations (SPV) in the Victorian Declared Wholesale Gas Market (VGM) and in the Short Term Trading Market (STTM).[1] For the VGM, the AER has already published significant price variation reporting triggers.[2] For the STTM hubs, the AER is in the process of developing triggers.

This report is not published under the formal SPV requirements. Instead, the report is published as part of the AER's overall monitoring function to provide details on high July 2012 prices in the VGM and in the Adelaide, Brisbane and Sydney STTM hubs. This report contains a summary of key price drivers and augments the analysis already provided in the AER gas weekly reports.[3]

As a result of the analysis undertaken in this report, the AER will be making further enquiries into participant demand forecasts, offers and bids. Any compliance issues will be reported in the AER's Quarterly Compliance Report.[4]

Structure of this report

Part 1 of this report focuses on outcomes for July 2012 at the Adelaide, Sydney and Brisbane hubs of the STTM and the Victorian market. Part 2 focuses on individual days in July in those markets.

Summary/assessment

High prices in July saw rolling 30 day average daily prices in all regions rise significantly. Most notably, the price increased by about $1.70/GJ in Adelaide over the month as a result of consecutive high price days from 2 July to 6 July. It is noted that these increases occurred soon after the introduction of the carbon price, but by around 10 July 2012 prices re-aligned with pre 1 July prices and the AER does not consider that the introduction of the carbon price explains the increases.

Adelaide recorded its highest ex ante price since market start, reaching $14.89/GJ on 4 July. The ex ante price did not fall below $5/GJ for the month, and was above $7/GJ on 9 occasions, leading to an average monthly price of $6.31/GJ.

The highest ex ante price in Sydney in July 2012 was $9/GJ (below the highest ever price of $17.30/GJ which occurred in June 2012[5]). The average ex ante price for the month of July was $6.75/GJ, with the price exceeding $7/GJ on 14 occasions.

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[1] In accordance with rule 355 and rule 498 of the National Gas Rules.

[2] The VGM price variation reporting triggers are—(i) if the *Trade Weighted Market Price* published by *AEMO* on a gas day is more than three times the average price for the previous 30 days and the *Trade Weighted Market Price* is equal to or greater than $15/GJ; (ii) if the *Ancillary Payment Amount* published by *AEMO* on a gas day is an amount payable or receivable which exceeds $250 000. See www.aer.gov.au/node/453.

[3] www.aer.gov.au/node/451

[4] www.aer.gov.au/node/454

While the majority of prices in Brisbane were below $5/GJ for the month, prices were 'jumpy' and exceeded $7/GJ on 10 occasions leading to an average price of $5.23/GJ.

A number of the higher ex ante price days in the STTM involved significant rebidding of offers between the D-2 schedule and final ex ante schedule into higher price bands.[6] In Sydney, AGL (and to a lesser degree Origin and TRUenergy) re-priced volumes into higher price bands on many high price days. In Adelaide, there was also significant re-pricing of offers into higher price bands including for the record 4 July price day. In Brisbane, smaller volumes of gas were re-priced; but ex ante prices often jumped up based on even small demand increases for the ex ante schedule. For example, prices would jump by more than $2/GJ because there were no gas offers made at prices between $6 and $8/GJ.

In Sydney there were some very significant differences between ex ante and ex post prices. The 27 July gas day ($17.41/GJ ex post price and $8.41/GJ ex ante price) involved the largest difference ever between the two prices in any STTM hub[7]. This was largely as a result of a steep Sydney offer curve with only small quantities of gas offers between $8/GJ and $45/GJ.

In Victoria, the maximum daily weighted price for July was $15.57/GJ on 7 July, the highest daily price in the market since November 2008. The price in Victoria reached levels just below $8/GJ on four days, with an average of $5.86/GJ for July.

Average prices for July 2012 were significantly higher than for July 2011 in all markets (the Brisbane hub only commenced in December 2011). Compared to July 2011, the average ex ante price in July 2012 was:

- 85 per cent higher in the Sydney STTM.
- 69 per cent higher in the Adelaide STTM.
- 62 per cent higher in the VGM.

Compared to July 2011, there was a reduction in the volume of gas offered in key price setting bands:

- in Sydney, the average volume of gas offered below $6/GJ was 13 per cent lower.
- in Adelaide the average volume of gas offered below $6/GJ was 20 per cent lower.
- in the VGM, the average volume of gas offered below $6/GJ was 21 per cent lower.

In Victoria, the long-term outage at Bass Gas continued to contribute to lower volumes of low priced injection bids (typically market participants at Bass Gas offer in around 50 to 60 TJ of gas priced at zero dollars when it is operating).

[5] Excluding one high price day caused by the submission of anomalous pipeline data in 2010.

[6] For each gas day, there are two provisional schedules (D-3 and D-2). The D-3 and D-2 schedules occur 3 and 2 days before the gas day, respectively. The ex ante schedule, also referred to as the D-1 schedule, occurs on the day before the gas day.

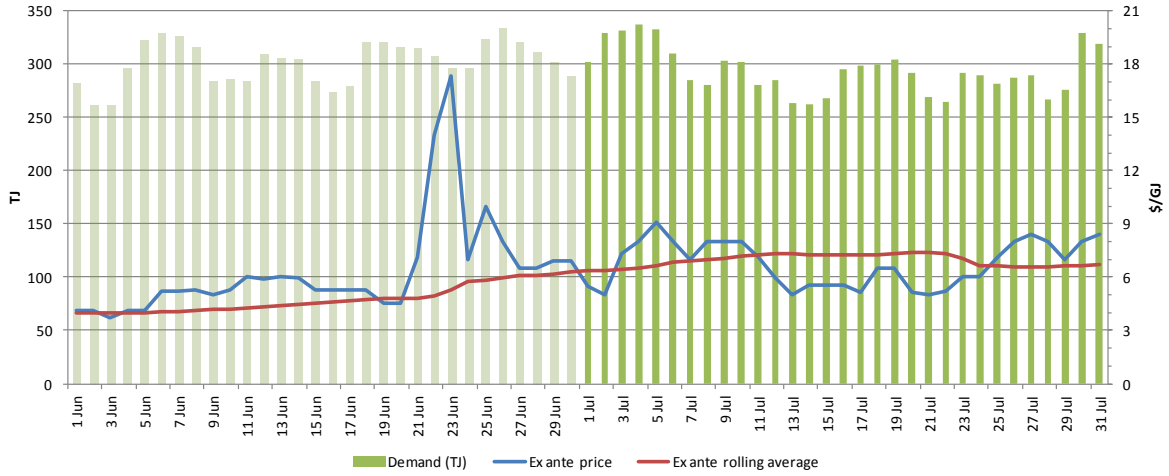
[7] Aside from two days of large price differences caused by anomalous pipeline data for the Sydney hub in 2010

Part 1 Outcomes for the month of July

Sydney hub prices

Figure 1 shows daily ex ante prices and demand for June and July 2012 along with the rolling 30 day average price.

Figure 1: Sydney ex ante prices and demand, June and July 2012



The rolling average ex ante price started July at around $6.30/GJ and settled slightly higher by the end of the month at $6.69/GJ.

Figures 2 and 3 compare key prices and quantities in the Sydney hub for July 2012 to July 2011. As shown in Figure 6 (and graphically in figure 7), the volume of offers at or below $6/GJ[8] fell by 45 TJ (or 13 per cent) from July 2011 to July 2012.

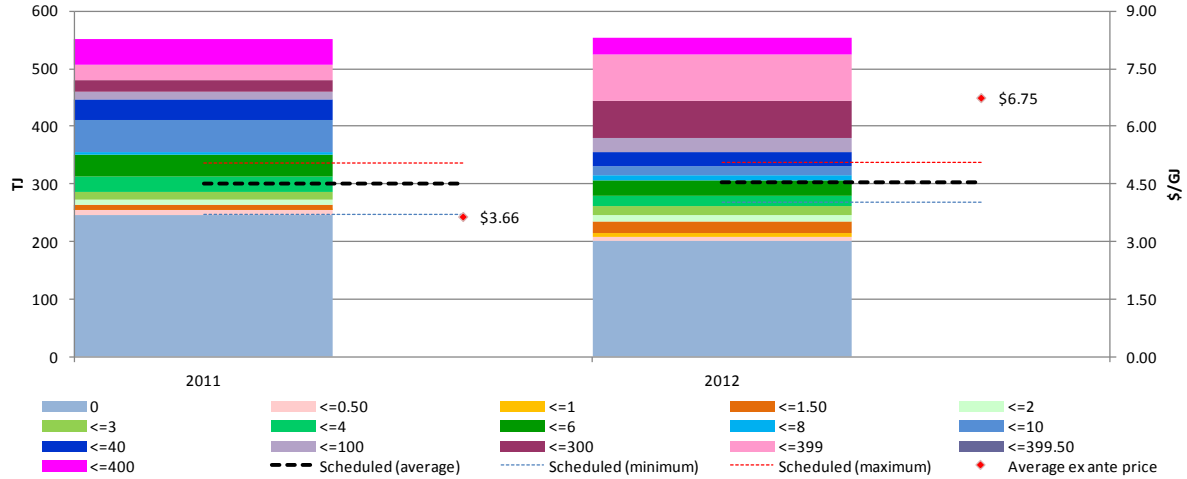
Figure 2: Sydney average daily key prices and inputs: July 2011 vs. July 2012

	Offers at or below $6/GJ (TJ)	Ex ante Volume (TJ)	Ex ante price ($/GJ)	Absolute imbalance volume (TJ)	Ex post price ($/GJ)[9]
July 2011	351	301	3.66	11.6	3.25
July 2012	306	303	6.75	8.2	7.36

[8] This offer price band was chosen as it is the closest to the July average ex ante price of $6.75/GJ.

[9] The ex post price is calculated after the gas day by using the same ex ante offers (and bids) but applying an imbalance amount to reflect what the price would have been had actual demand (determined after the day) been used. For example, if demand was under forecast, an ex post bid will be added to the ex ante market schedule to determine an ex post price that is equal to or higher than the ex ante price. If demand was over forecast, an ex post offer will be added to determine an ex post price that is equal to or less than the ex ante price.

Figure 3: Sydney ex ante offers ($/GJ) and scheduled quantities (TJ): July 2011 vs. July 2012

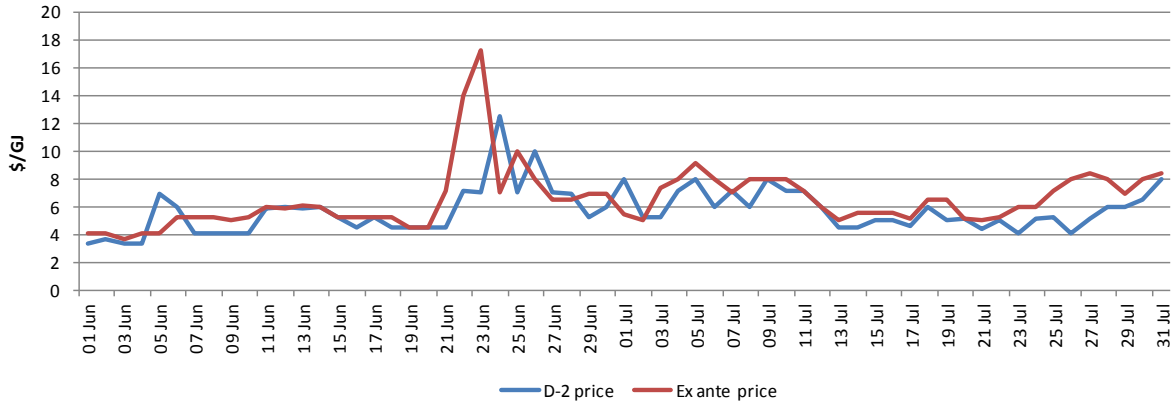


Although the average daily ex ante volume of gas scheduled in July 2012 was only 2 TJ higher than in July 2011, at $6.75/GJ, the average ex ante price was over $3/GJ higher (or 85 per cent). This is reflective of the significant reduction in offers below $6/GJ.

As shown in figure 2, the average imbalance quantity (in absolute terms) in July 2012 was 8.2 TJ (down from 10 TJ in June). The ex post price was on average 61 cents higher for the month than the ex ante price; although days of under and over forecast demand were almost even. Further analysis indicates that steep offer curves for gas days such as 27 July 2012 (see later in the report) caused significantly higher ex post prices for positive imbalances (under-forecasts of demand).

Figure 4 compares the ex ante price to the final provisional (D-2) price for June and July in Sydney. In July, Sydney ex ante prices on a number of days were significantly higher than provisional prices—pricing outcomes for the 26 July and 27 July gas days are discussed in detail in the next section of the report.

Figure 4: Sydney D-2 and ex ante price comparison for June and July 2012

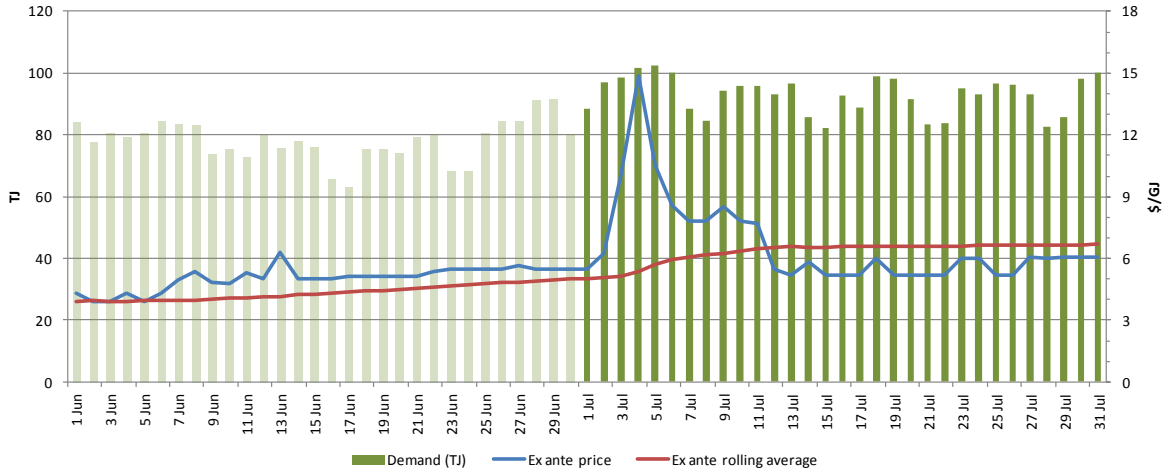


In July, the ex ante price was 93 cents—or 18.5 per cent—higher than the D-2 price.

Adelaide hub prices

Figure 5 shows daily ex ante prices and demand for July 2012 along with the rolling 30 day average price.

Figure 5: Adelaide ex ante prices and demand, June and July 2012



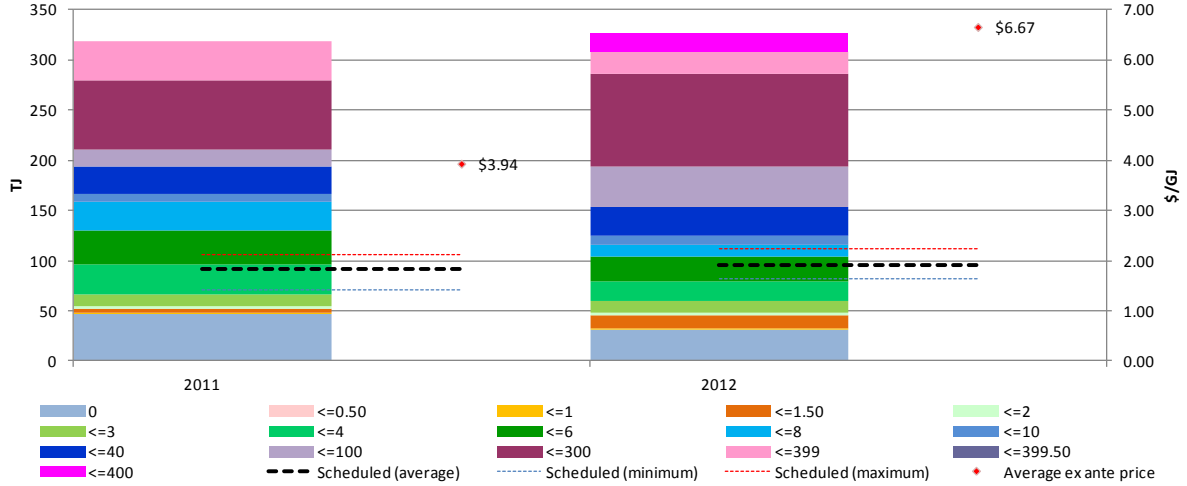
The rolling average ex ante price started July at around $5/GJ and settled at just below $6.70/GJ by the end of the month.

Figures 6 and 7 compare key prices and quantities in the Adelaide hub for July 2012 to July 2011. As shown in Figure 6 (and graphically in figure 7), the volume of offers at or below $6/GJ[10] fell by 26 TJ or 20 per cent from July 2011 to July 2012.

Figure 6: Adelaide average daily key prices and inputs: July 2011 vs. July 2012

	Offers at or below $6/GJ (TJ)	Ex ante Volume (TJ)	Ex ante price ($/GJ)	Absolute imbalance volume (TJ)	Ex post price ($/GJ)
July 2011	130	91	3.94	3.9	4.03
July 2012	104	95	6.67	3.3	6.87

Figure 7: Adelaide ex ante offers ($/GJ) and scheduled quantities (TJ): July 2011 vs. July 2012



Although the average daily ex ante volume of gas scheduled in July 2012 was 4 TJ higher than in July 2011, at $6.67/GJ, the average ex ante price was $2.73/GJ higher (up 69 per cent). This is reflective of the significant reduction in offers below $6/GJ.

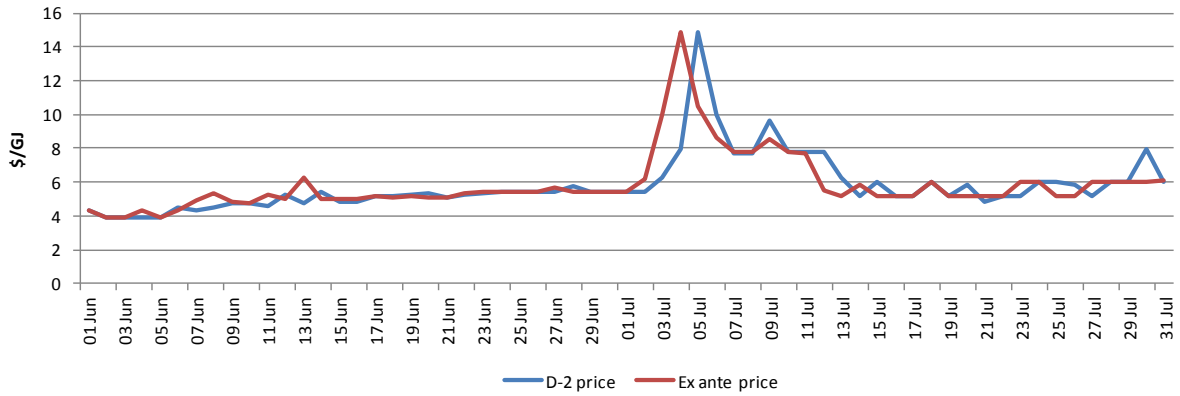
As shown in figure 6, the average imbalance quantity (in absolute terms) in July 2012 was 3.3 TJ, close to the 3.9 TJ for the previous year. Despite demand being over-forecast on 25 of

[10] This offer price band was chosen as it is the closest to the July average ex ante price of $6.67/GJ.

the 31 days in July, the average ex post price was higher than the ex ante price. As for Sydney, this is reflective of a steep ex post supply curve at higher prices.

Figure 8 compares the ex ante price to the final provisional (D-2) price for June and July. In July, Adelaide ex ante prices on some days were significantly different from provisional prices —pricing outcomes for the 3 and 4 July gas days (higher ex ante prices), and 5 July (lower ex ante price) are discussed in detail in the next section of the report.

Figure 8: Adelaide D-2 and ex ante price comparison for June and July 2012

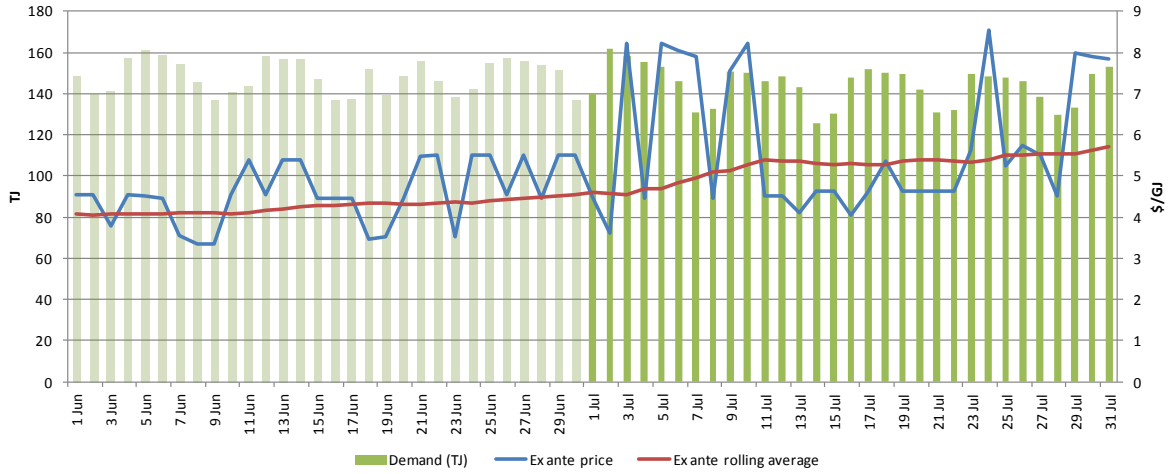


On average, the ex ante price was 2 cents lower than the D-2 price in July.

Brisbane hub

Figure 9 shows daily ex ante prices and demand for July 2012 along with the rolling 30 day average price.

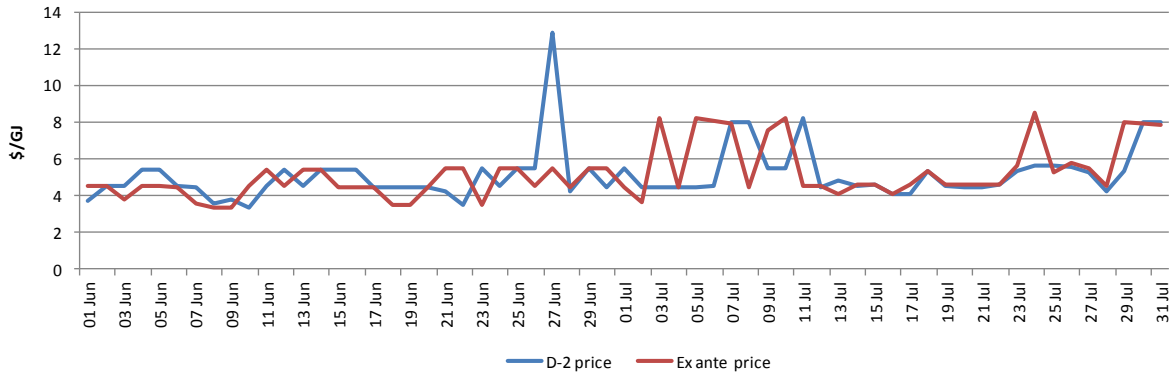
Figure 9: Brisbane ex ante prices and demand for, June and July 2012



The rolling average ex ante price started July around $4.50/GJ and settled at around $5.70/GJ by the end of the month.

Figure 10 below compares the ex ante price to the final provisional (D-2) price for June and July. In July, Brisbane ex ante prices on some days were significantly higher than ex post prices. Pricing outcomes for the 5 July and 6 July gas days are discussed in detail in the next section of this report.

Figure 10: Brisbane D-2 and ex ante price comparison for June and July 2012

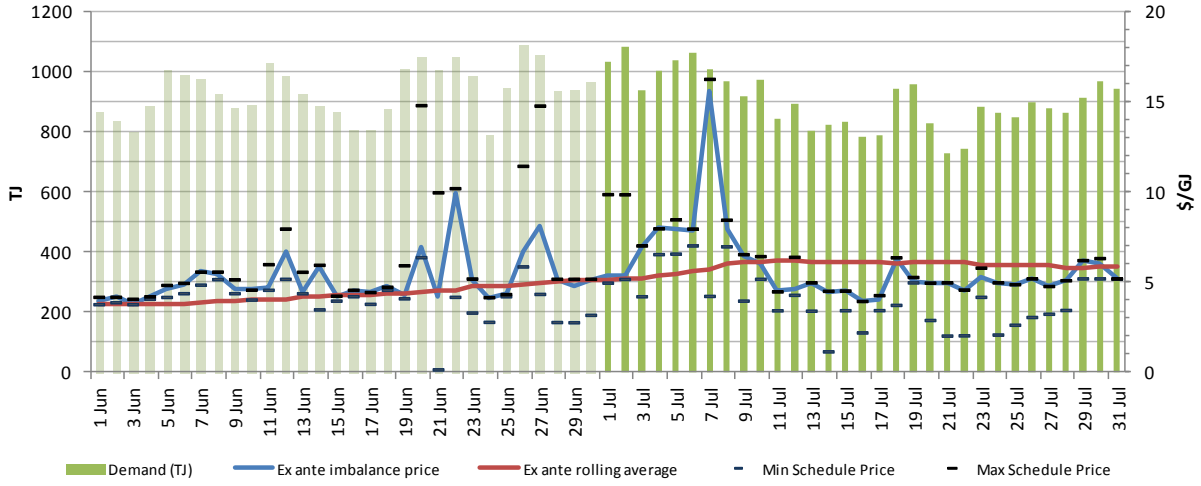


In July, the average ex ante price was 41 cents higher than the D-2 price (because of a number of days when the ex ante price jumped up from the D-2 forecast price).

Victorian market prices

Figure 11 shows minimum and maximum daily schedule prices, the weighted daily price (the ex ante imbalance price), the rolling average daily price, and demand. Unlike the Sydney, Adelaide and Brisbane markets, the Victorian Gas Market (VGM) has 5 schedules and 5 prices a day at 6 am, 10 am, 2 pm, 6 pm and 10 pm respectively.

Figure 11: Prices and demand in the Victorian market, July 2012



The past 30 day rolling average of weighted prices in Victoria (the red line in figure 11) increased by around 80 cents by the end of July from $5.10/GJ to $5.90/GJ.

On Saturday 7 July, the weighted average imbalance price reached $15.57/GJ, the highest price since 22 November 2008[11].

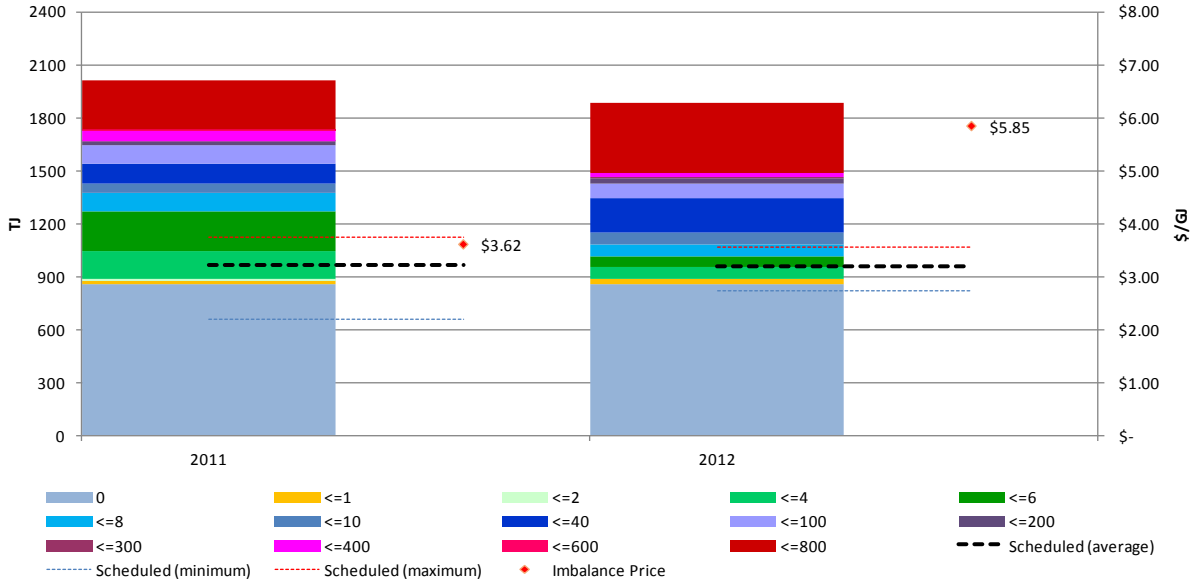
Figures 12 and 13 compare key prices and quantities in the VGM for July 2012 to July 2011. As shown in figure 12 (and graphically in figure 13), the volume of offers at or below $6/GJ at 6 am fell by 20 per cent from July 2011 to July 2012.[12]

[11] On this day the imbalance price reached $54.88/GJ (there was a VOLL price ($800/GJ) at 10pm.).
[12] This offer price band was chosen as it is the closest to the July average ex ante price of $5.85/GJ.

Figure 12: Average daily key prices and inputs

	6 am Injection bids at or below $6/GJ (TJ)	6 am demand (TJ)	Weighted daily Price ($/GJ)	Average difference of min and max schedule price on day ($/GJ)
July 2011	1272	967	3.62	0.81
July 2012	1018	959	5.85	2.28

Figure 13: 6 am injection bids ($/GJ) and minimum, maximum, and average scheduled quantities (TJ)



The most significant factor in July 2012 prices being higher than July 2011 prices appears to be the reduction in offers below $6/GJ.

Part 2 Daily outcomes

This section of the report contains detailed analysis on key high price days in July.

Sydney hub

The following contains analysis on certain high price days throughout July. The days have been chosen on the basis that the ex ante prices were close to or above $8/GJ, and the ex post prices were close to or above $9/GJ.

5 July

Figure S1 shows the ex ante and ex post prices on 5 July were higher than the D-3 and D-2 provisional schedule prices. The demand forecasts were relatively accurate, as indicated by an imbalance of only 2.75 TJ.

Figure S1: Provisional, ex ante and ex post prices and quantities, 5 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	5.89	8.00	9.10	8.98
Quantity (TJ)	325.3	333.5	333	-2.75 (Long)

The accuracy of individual participants' demand forecasts can be measured by comparing the quantities of their price taker bids to their share of actual hub demand. On 5 July, two of the three major participants[13] in the Sydney hub forecast their demand relatively accurately, with the other under forecasting its demand by about 15 per cent.

Figure S2 shows the offers for the provisional schedules (D-3 and D-2) and the ex ante schedule (D-1). It also shows the amount of gas scheduled (the red line) and the amount of price taker bids (the black dotted line).[14]

Figure S2: Provisional, ex ante (D-1) and ex post prices and quantities, 5 July

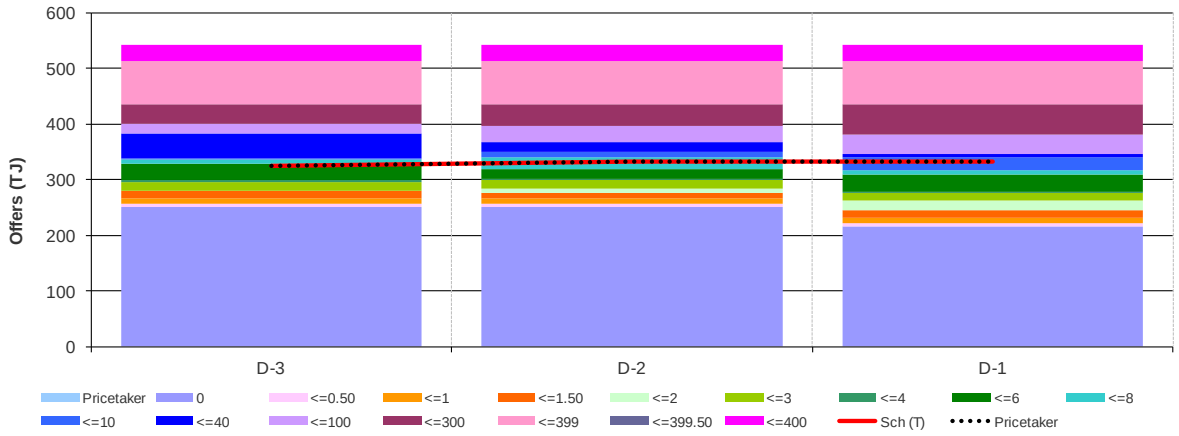


Figure S2 shows a reduction in $0/GJ offers was the main driver behind the ex ante price reaching $9.10/GJ. In the provisional schedules, around 250 TJ was offered at $0/GJ,

[13] Major STTM user 'participants' for the Sydney hub are Origin, AGL and TRUenergy whose demand forecasts typically comprise at least 10 per cent each of total hub demand.

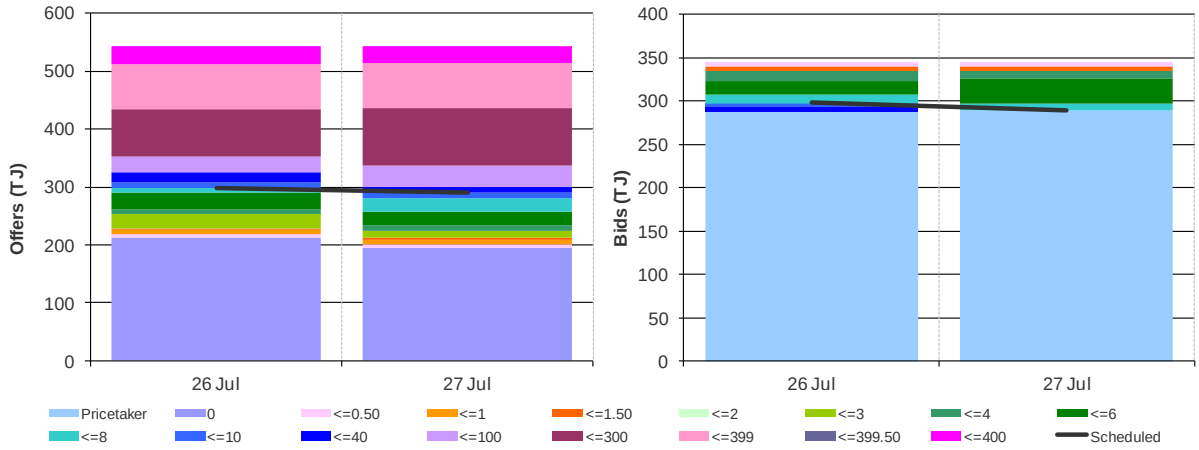
[14] In the STTM, gas supply offers are scheduled to meet all price taker bids or demand forecasts *plus* any price dependant bids (or ex ante bids) i.e. for backhaul. Compared to consistent high price taker bid volumes, volumes of ex ante bids priced to be scheduled are often low or zero. Therefore, the volume of price taker bids and volume of scheduled gas are often aligned.

however, on the gas day the quantity dropped by 34 TJ to just over 216 TJ. AGL was the main contributor, reducing its $0/GJ offer for the ex ante schedule by 30 TJ.

26–27 July

Figure S3 shows offers and bids by price bands for 26 July and 27 July. It also shows scheduled demand (the black line).

Figure S3: Daily Sydney hub offers and bids in price bands 26–27 July ($/GJ)



26 July

Figure S4 shows how price fluctuated throughout the schedules. The scheduled quantity increased by over 12 TJ from the D-2 schedule to the ex ante schedule. Despite this increase, the hub was still short on the day, with a 12.84 TJ imbalance. The three major participants under forecast demand by around 4–6 per cent, resulting in the +12.84 TJ imbalance and the higher ex post price.

Figure S4: Provisional, ex ante and ex post prices and quantities, 26 July

	D-3	D-2	Ex ante(D-1)	Ex post
Price ($/GJ)	5.20	4.03	7.99	9.99
Quantity (TJ)	287.8	286.2	298.7	+12.84 (S)

Figure S5 shows offers, price taker bids and scheduled gas for 26 July 2012.

Figure S5: Provisional, ex ante and ex post prices and quantities, 26 July

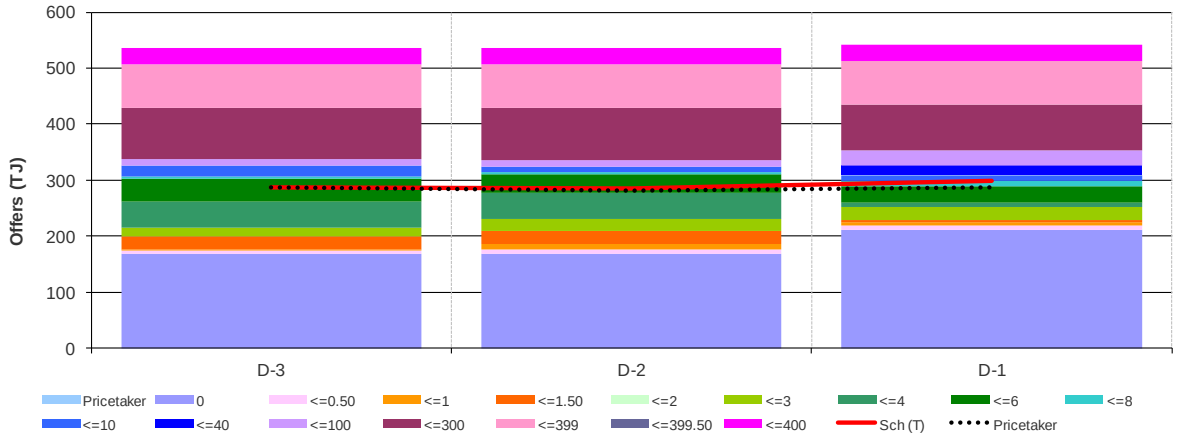


Figure S5 shows there were more $0/GJ offers (212 TJ) in the D-1 schedule than in the provisional schedules (170 TJ). The major reason for this was that AGL rebid 45 TJ from prices between $1-$4/GJ to $0/GJ. However, this rebidding did not influence the ex ante price as gas offers priced above $4/GJ were required to meet demand across all schedules.

With forecast demand for the ex ante schedule higher than that forecast in provisional schedules, and a limited volume of gas offered at prices in the $4 to $8/GJ price range, the ex ante price increased to $7.99/ GJ from the D-2 forecast.

27 July

Figure S6 shows prices were relatively low and closely aligned in the provisional schedules, but increased for the ex ante schedule. Forecast demand also fluctuated significantly.

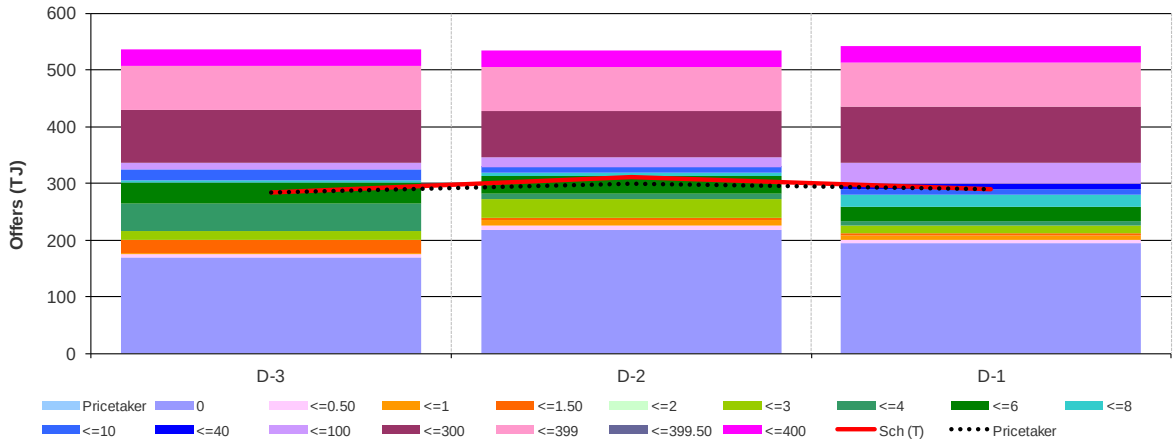
Figure S6: Provisional, ex ante and ex post prices and quantities, 27 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	5.02	5.10	8.41	17.99
Quantity (TJ)	284.9	310.9	289.5	+6.72 (S)

The three major participants submitted reasonably accurate demand forecasts for the ex ante schedule, as reflected by the 6.72 TJ market short imbalance. Despite this small imbalance, the ex post price was $9.58/GJ higher than the ex ante price.

Figure S7 shows offers, price taker bids and scheduled gas for the 27 July gas day.

Figure S7: Provisional, ex ante and ex post prices and quantities, 27 July



The D-2 schedule saw a 12 TJ hub withdrawal bid cleared. This did not carry over to the ex ante schedule. Compared to the D-2 schedule, for the ex ante schedule:

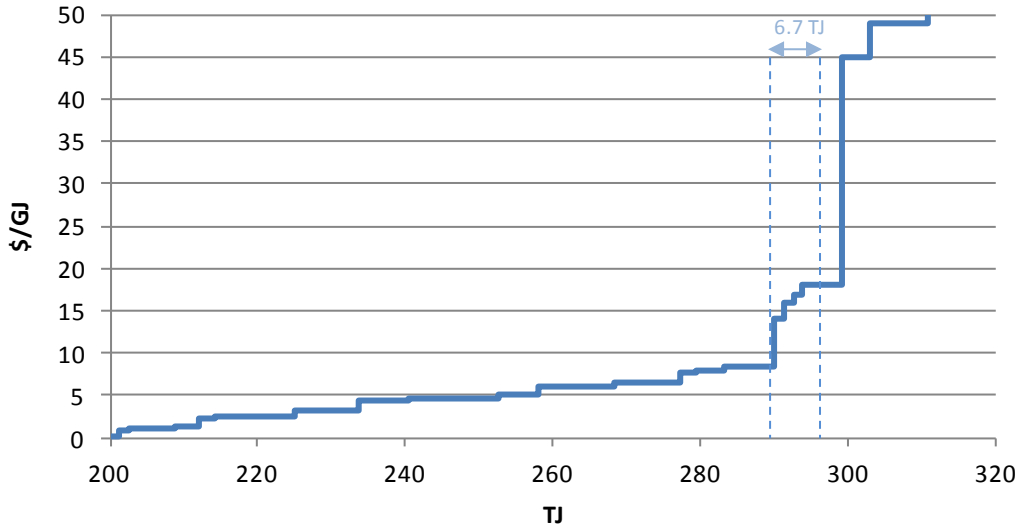
- rebidding by TRUenergy and AGL saw a 24 TJ reduction in offers at $0/GJ
- there was a lower volume of gas priced below $6/GJ
- nearly 17 TJ more gas was offered at between $6–$8/GJ and
- almost 8 TJ more was offered between $10–$40/GJ.

Overall AGL, Origin, and TRUenergy removed a total of 30 TJ of offers from prices between $2–$6/GJ, moving 26 TJ into prices above $6/GJ. Although less gas was scheduled for the

ex ante schedule than the D-2 schedule, the ex ante price was higher as a result of changes to offer volumes and prices.

The ex post price ($17.99/GJ) was $9.58/GJ higher than the ex ante price despite only a small (6.72 TJ) imbalance on the gas day. Figure S8 shows the supply curve for the Sydney hub on 27 July. It can be seen how the existence of only small volumes of gas offers in prices above $8/GJ up to about $45/GJ caused the large difference between the ex ante and ex post price. The inelasticity of the curve at around 280-310 TJ made the price very sensitive to changes in scheduled (ex ante price based on 289.5 TJ) or allocated gas (ex post price based on 289.5 TJ + 6.72 TJ imbalance). The ex post price would have been much higher than $17.99/GJ had allocated gas been only a few TJ higher.

Figure S8: Offer curve for the Sydney hub from ex ante market schedule, 27 July



31 July

Figure S9 shows how forecast demand increased at each schedule for the 31 July gas day, leading to increased prices. Higher scheduled volumes in the D-2 and ex ante schedule resulted from additional volumes of withdrawal bids priced at $9.99/GJ or higher in each schedule. Forecast demand in the hub remained stable in the provisional schedules, before reducing by over 5 TJ in the ex ante schedule. This saw actual demand requirements in the hub reach higher than forecast levels, leading to the further increase in the ex post price due to the large imbalance.

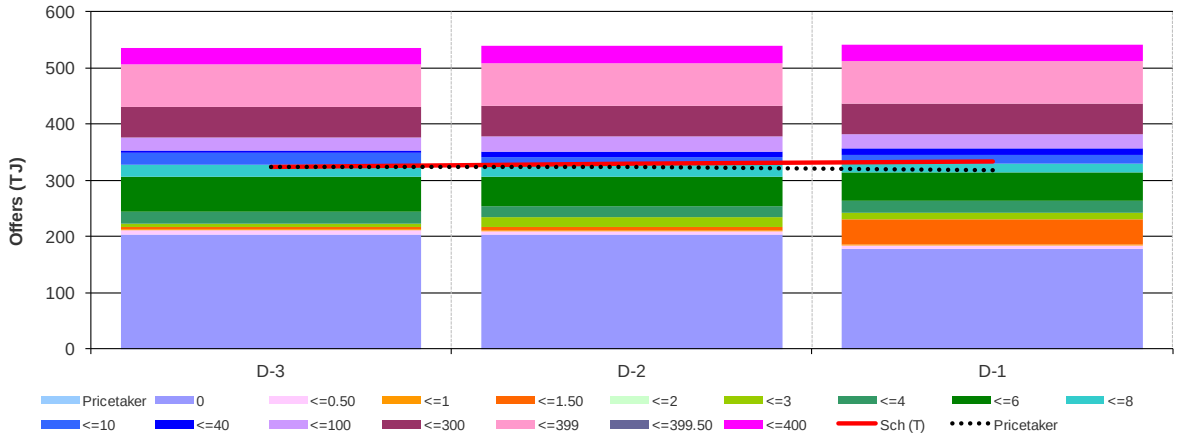
Figure S9: Provisional, ex ante and ex post prices and quantities, 31 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	6.50	8.00	8.40	9.99
Quantity (TJ)	324.6	329.6	334.0	+13.99 (S)

On 31 July, the major participants in the Sydney hub under forecast their hub demand, one by over 10 per cent. This significantly influenced the 14 TJ imbalance quantity and led to a higher ex post price.

Figure S10 shows offers, price taker bids and scheduled gas for the 31 July gas day.

Figure S10: Provisional, ex ante and ex post prices and quantities, 31 July



Despite gas offers below $8/GJ increasing in the D-2 and ex ante schedules, forecast demand increased beyond the additional volume, driving up the price. Rebidding had minimal effect on increased prices.

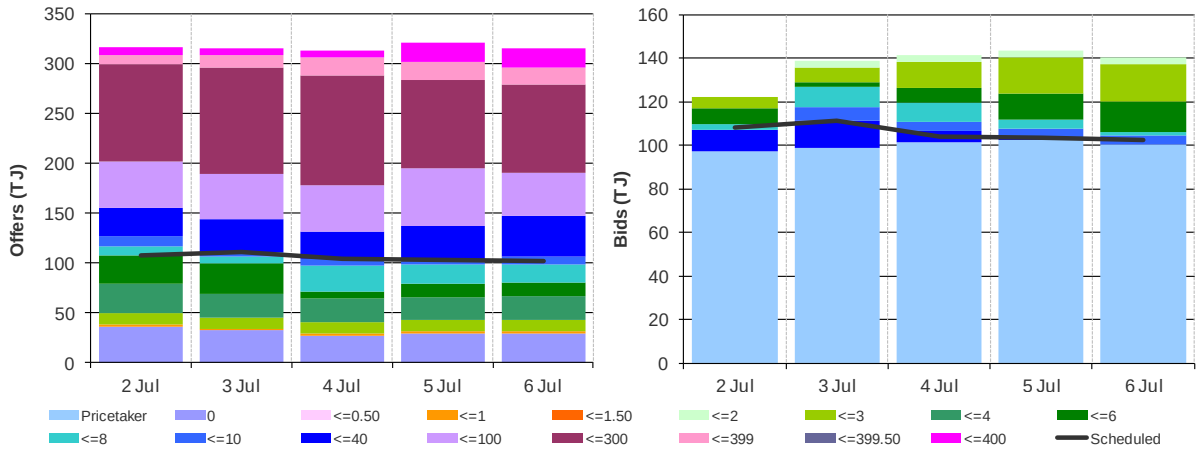
Adelaide hub

The following contains analysis on certain high price days throughout July for the Adelaide STTM hub. The days have been chosen on the basis that the ex ante prices were above $6/GJ and the ex post prices were above $9/GJ.

2–6 July

Figure A1 shows offers and bids by price bands for 2 July to 6 July. It also shows scheduled demand (the black line).

Figure A1: Daily Adelaide hub offers and bids in price bands 2–6 July ($/GJ)



2 July

Figure A2 shows demand forecasts and prices showed only small variations across the provisional schedules and the ex ante schedule. On the gas day, higher demand than forecast resulted in a +14.15 TJ imbalance, pushing up the ex post price.

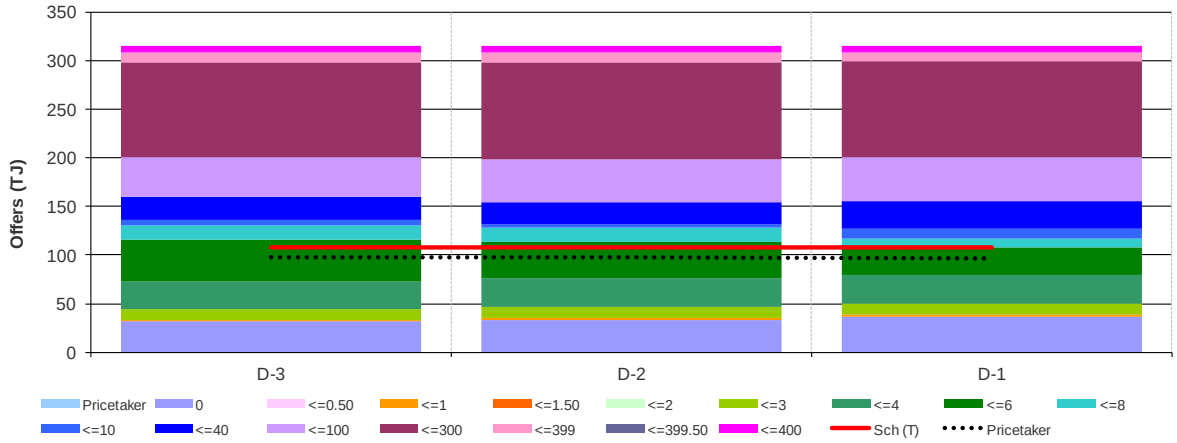
Figure A2: Provisional, ex ante and ex post prices and quantities, 2 July

	D-3	D-2	Ex ante	Ex post
Price ($/GJ)	5.46	5.46	6.22	9.60
Quantity (TJ)	107.5	107.6	108.2	+14.15 (S)

Three of the four major participants in the Adelaide hub had accurate demand forecasts.[15] The other major participant under forecast its demand by around 21 per cent, significantly impacting on the imbalance quantity on the gas day and the higher ex post price.

Figure A3 shows the offers for the provisional schedules (D-3 and D-2) and the ex ante schedule (D-1). It also shows the amount of gas scheduled (the red line) and the amount of price taker bids (the black dotted line).

Figure A3: Provisional, ex ante and ex post prices and quantities, 2 July



The only notable variation to offers was a 14 TJ shift in gas offers from the $3–$8/GJ price range, with 8 TJ rebid to above $40/GJ for the ex ante schedule by TRUenergy.

With limited volumes of gas priced between $6 and $10/GJ the addition of the market short imbalance of 14.5 TJ for ex post price calculation resulted in a $3.38/GJ higher ex post price of $9.60/GJ.

3 July

Figure A4 shows the ex ante price was significantly higher than the provisional prices and the ex post price was significantly higher than the ex ante price.

Figure A4: Provisional, ex ante and ex post prices and quantities, 3 July

	D-3	D-2	Ex ante	Ex post
Price ($/GJ)	5.46	6.24	10.00	14.89
Quantity (TJ)	108.8	108.4	111.4	+4.82 (S)

Similar to the 2 July gas day in the Adelaide hub, three of the four major participants forecast their demand with high accuracy, whereas the remaining participant under forecast its demand by around 13 per cent, influencing the higher ex post price.

Figure A5 shows offers, price taker bids and scheduled gas for the 3 July gas day.

[15] Major STTM user 'participants' for the Adelaide hub are Origin, AGL, TRUenergy and Adelaide Brighton Cement whose demand forecasts typically comprise at least 10 per cent each of total hub demand.

Figure A5: Provisional, ex ante and ex post prices and quantities, 3 July

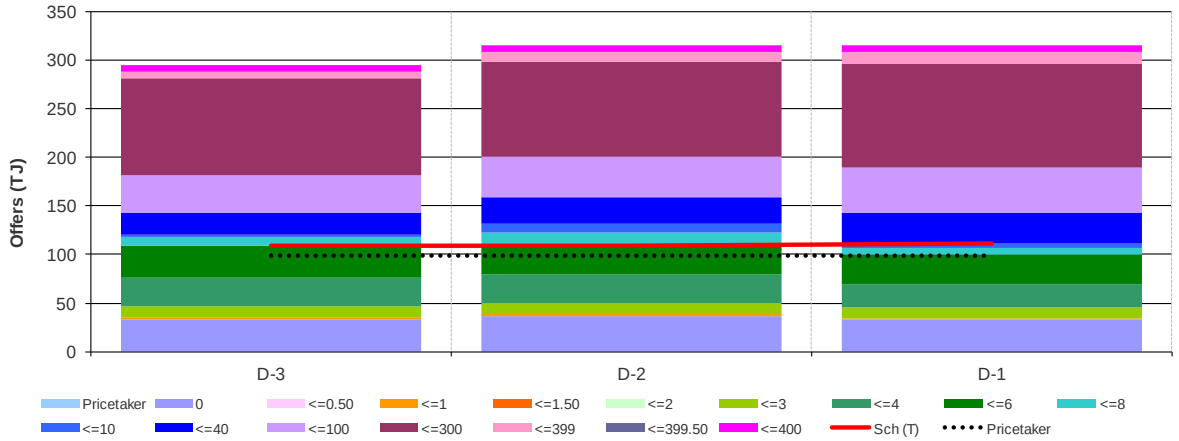


Figure A5 illustrates rebidding resulted in 20 TJ of gas priced below $10/GJ being shifted into higher priced bands, which drove significant increases in the ex ante and ex post price. A number of different participants were responsible for rebidding into higher prices.

4 July

Figure A6 provides an overview of the price and quantity levels for the 4 July gas day. The ex ante and ex post price on the day were the highest ever recorded in the Adelaide hub. Despite a reduction in forecast demand for the ex ante schedule compared to the D-2 provisional schedule, the ex ante price was significantly higher.

Figure A6: Provisional, ex ante and ex post prices and quantities, 4 July

	D-3	D-2	Ex ante	Ex post
Price ($/GJ)	6.59	7.99	14.89	16.00
Quantity (TJ)	109.7	114.2	103.9	+2.65 (S)

For the 4 July gas day, all participants' price taker bids were highly accurate and consistent across schedules. The reason why the quantity dropped for the ex ante schedule is because 12 TJ of backhaul that was previously scheduled in the D-2 schedule was not scheduled ex ante. This happened because as the gas price rose, the backhaul bid was not priced high enough to be scheduled.

Figure A7 shows offers, price taker bids and scheduled gas for the 4 July gas day

Figure A7: Provisional, ex ante and ex post prices and quantities, 4 July

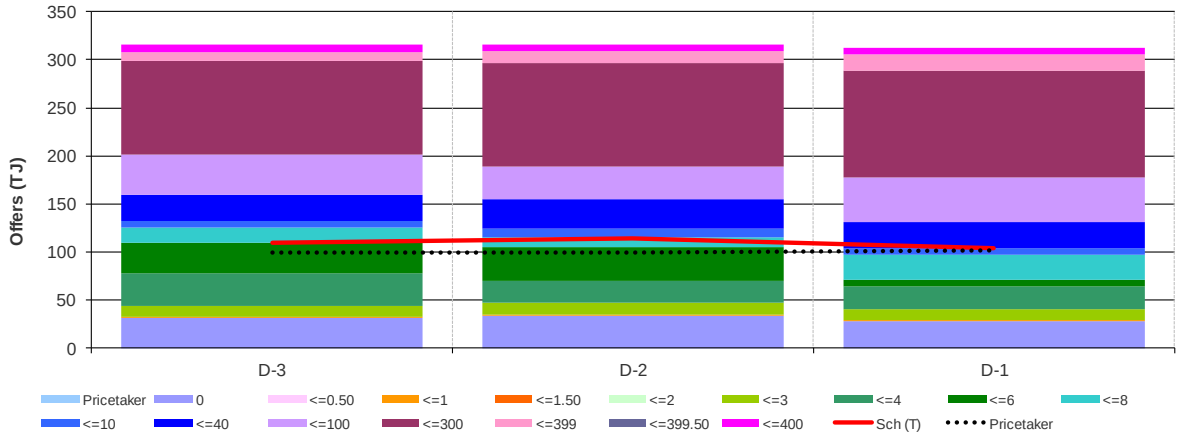


Figure A7 shows that, from the D-2 schedule to the ex ante schedule, there was a reduction of 5 TJ in offers priced at $0/GJ, and 27 TJ between $4–$6/GJ. Origin reduced its offers by 21 TJ in the $4–$6/GJ price range for the ex ante schedule, reoffering this gas in the $6–$8/GJ range. This shifting of gas into higher price bands drove the price up to $14.88/GJ.

5 July

Figure A8 provides an overview of the price and quantities for the 5 July gas day. The quantity decreases at each schedule, finishing with a -3.71 TJ ex post imbalance. The provisional schedules show the market was expecting a high ex ante price.

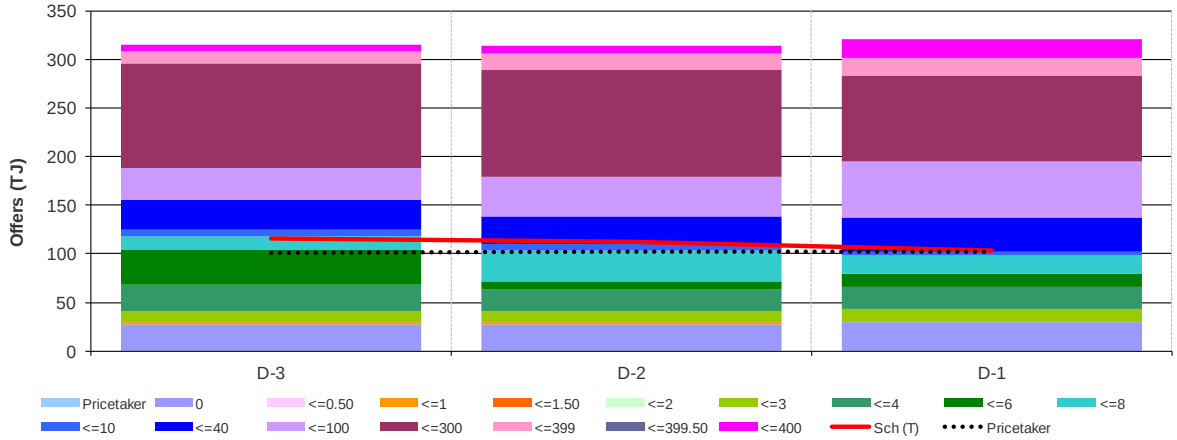
Figure A8: Provisional, ex ante and ex post prices and quantities, 5 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	7.99	14.89	10.50	9.60
Quantity (TJ)	115.7	112.2	103.6	-3.71 (L)

Three of the four major participants forecast their demand accurately, however the remaining participant under forecast its demand by more than 12 per cent.

Figure A9 shows offers, price taker bids and scheduled gas for the 5 July gas day.

Figure A9: Provisional, ex ante and ex post prices and quantities, 5 July



The ex ante price was lower than the D-2 price. This was a result of lower scheduled demand for the ex ante schedule, and more gas offered at lower prices (higher priced gas was rebid into lower bands, with 7 TJ shifted into bands priced below $6/GJ). The reduction in ex ante quantity shown in figure A9 was also influenced by a lower scheduled volume of withdrawal bids being cleared, as participants either removed bids or rebid into lower price bands.

6 July

Figure A10 provides an overview of prices and quantities for the 6 July gas day. The quantity decreased at each schedule, finishing with a +1.99 TJ ex post imbalance as the market was short 2 TJ on the gas day.

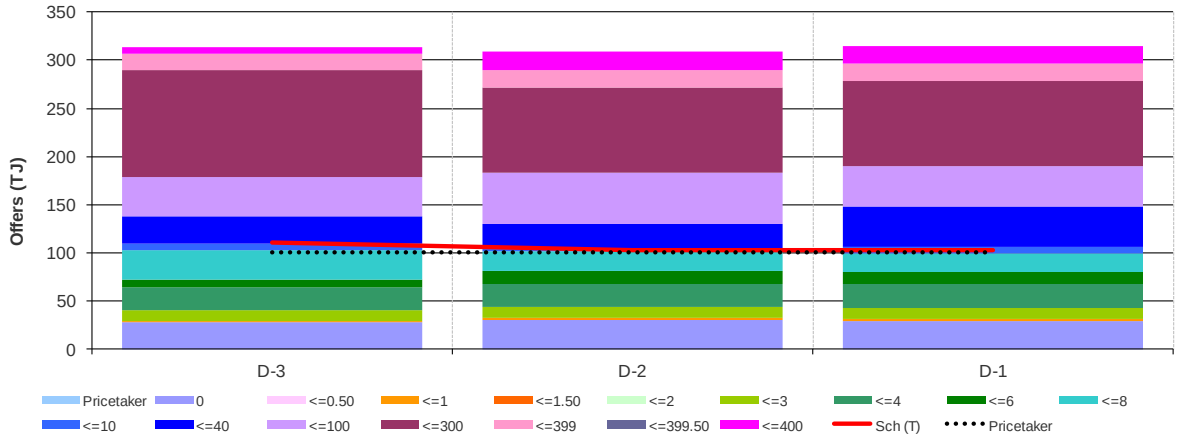
Figure A10: Provisional, ex ante and ex post prices and quantities, 6 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	14.25	10.00	8.60	9.10
Quantity (TJ)	111.0	102.7	102.3	+1.99 (S)

Similar to the previous gas day, three of the four major participants forecast their demand highly accurately, while one participant over forecast its demand by over 9 per cent. As shown in figure A11, price taker bids remained relatively constant throughout the provisional schedules and the ex ante and ex post schedules.

Figure A11 shows offers, price taker bids and scheduled gas for the 6 July gas day. The figure shows that scheduled quantity and price fell across the schedules.

Figure A11: Provisional, ex ante and ex post prices and quantities, 6 July



Brisbane hub

The following contains analysis on certain high price days throughout July for the Brisbane hub. The days have been chosen on the basis that the ex ante and ex post prices were above $8/GJ.

5 July

Figure B1 shows that even though the quantities gradually reduced over the schedules for the 5 July gas day, the ex ante and ex post prices were higher than forecast in the provisional schedules.

Figure B1: Provisional, ex ante and ex post prices and quantities, 5 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	4.45	4.45	8.22	8.21
Quantity (TJ)	178.3	174.1	173.8	-2.61 (L)

All five major participants'[16] demand forecasts were highly accurate.

Figure B2 shows the offers for the provisional schedules (D-3 and D-2) and the ex ante schedule (D-1). It also shows the amount of gas scheduled (the red line) and the amount of price taker bids (the black dotted line).

[16] Major participants in the Brisbane hub whose price taker bids exceed 10 per cent of demand are AGL, Origin, BP, Incitec Pivot and Stanwell.

Figure B2: Provisional, ex ante and ex post prices and quantities, 5 July

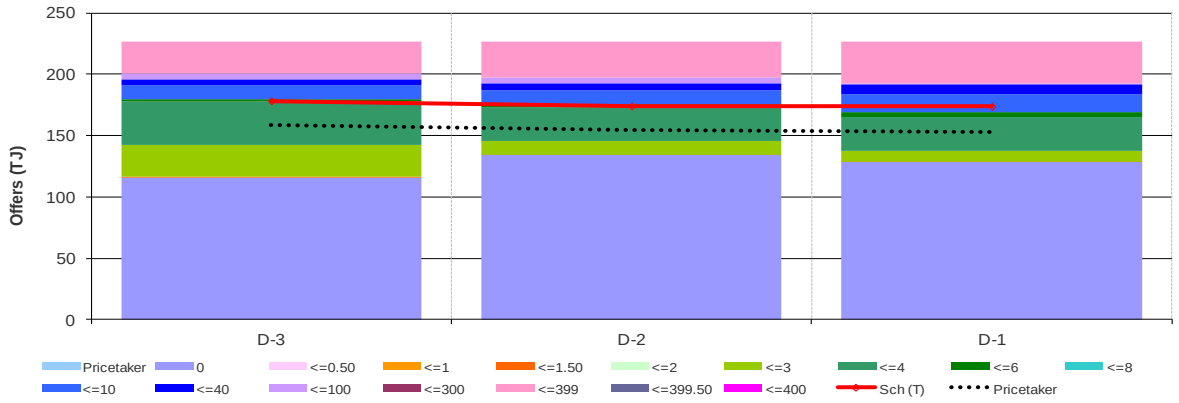


Figure B2 shows that even though the quantities gradually reduced over the schedules, the ex ante and ex post prices were higher than forecast in the provisional schedules. The high ex ante price was largely caused by a reduction in offers around $0/GJ and $2–$3/GJ. The largest rebid was by AGL, reducing its $0/GJ offers from 31 TJ to 26 TJ. It is interesting to note that there were no offers priced between $6/GJ and $8/GJ at any schedule.

6 July

Figure B3 shows that even though the quantities gradually reduced over the schedules, the ex ante and ex post prices were higher than forecast in the provisional schedules for the 6 July gas day.

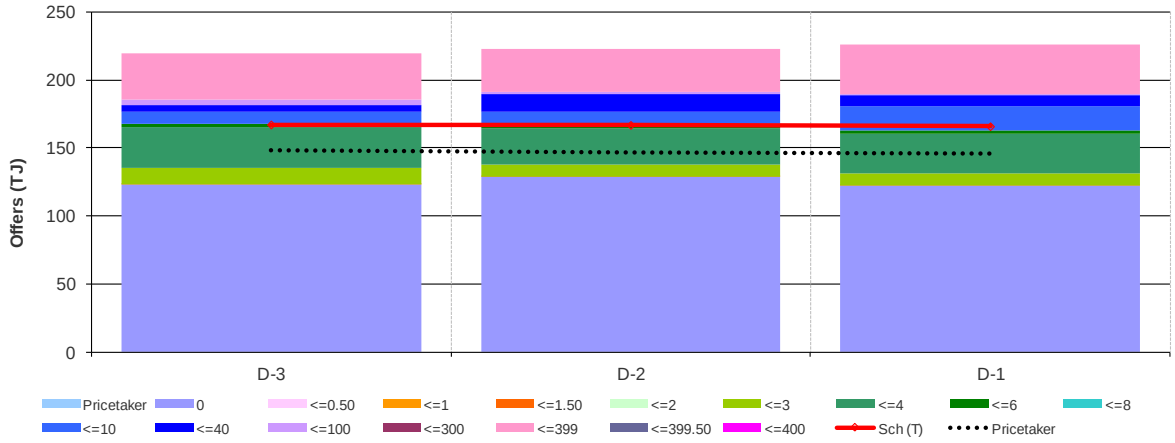
Figure B3: Provisional, ex ante and ex post prices and quantities, 6 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	5.51	4.51	8.04	8.03
Quantity (TJ)	167.1	166.8	165.8	-1.89 (L)

As for the 5 July gas day, the five major participants' demand forecasts were highly accurate.

Figure B4 shows offers, price taker bids and scheduled gas for the 6 July gas day.

Figure B4: Provisional, ex ante and ex post prices and quantities, 6 July



Similar to 5 July, a reduction in lower priced gas offers resulted in higher priced gas offers being scheduled in order to meet demand. The biggest driver was a decrease in $0/GJ gas offers. Again, the largest rebid was by AGL, reducing its $0/GJ offers from 31 TJ to 26 TJ. It is interesting to note that again there were no offers priced between $6/GJ and $8/GJ at any schedule.

7 July

For 7 July, figure B5 shows, again, that even though the quantities gradually reduced over the schedules, the ex ante and ex post prices were higher than forecast in the provisional schedules.

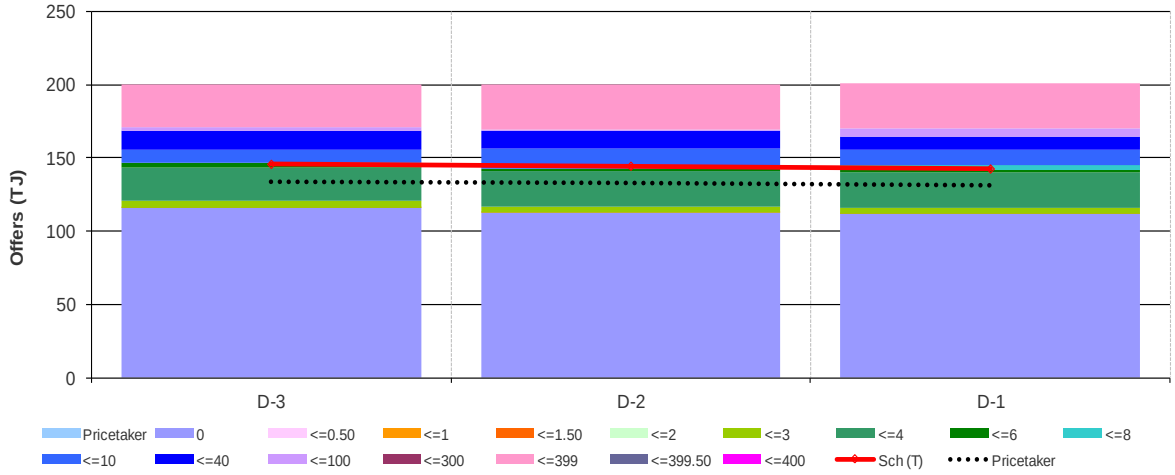
Figure B5: Provisional, ex ante and ex post prices and quantities, 7 July

	D-3	D-2	Ex ante (D-1)	Ex post
Price ($/GJ)	4.51	8.03	7.90	8.21
Quantity (TJ)	145.8	144.5	142.6	+2.30 (S)

Demand forecasts were generally accurate, with a couple of participants' demand forecasts out by around 2 TJ.

Figure B6 shows offers, price taker bids and scheduled gas for the 7 July gas day.

Figure B6: Provisional, ex ante and ex post prices and quantities, 7 July



Unlike the two previous days, higher prices were forecast in the provisional schedules (D-2).

Victorian gas market (VGM)

This section contains analysis on certain high price days throughout July in the VGM. The days have been chosen on the basis that the price for at least one of the schedules was close to or above $10/GJ.

1 July

As shown in figure V1, on 1 July forecast demand increased throughout the day until the final schedule. A 12 TJ override by AEMO, the market operator saw forecast demand reduced at 10 pm.

Figure V1: 1 July gas day information

Schedule	6 am	10 am	2 pm	6 pm	10 pm	Daily weighted price
Price ($/GJ)	5.22	4.99	5.96	9.90	5.00	5.34
Demand forecast (TJ)	1024	1035 (+10)	1054 (+20)	1064 (+10)	1051 (-13)	
AEMO override (TJ)*	0	0	0	0	-12	
Change in Injection bids <=$6/GJ (TJ)	N/A	5.3	13.1	8.3	16.3	
Change in withdrawal bids >$6/GJ (TJ)**	N/A	9.0	10.5	2.5	0.0	

*AEMO override is applied to participant's demand forecasts when in accordance with a defined AEMO procedure, the aggregated participant forecasts are considered to be outside a threshold level of accuracy (override is applied based on system security reasons).
** The $6/GJ threshold has been chosen for both injection bids and withdrawal bids as $8/GJ is one of the critical pricing points for determining the schedule price—more injection bids below $6/GJ will put downward pressure on the price; more withdrawal bids above $6/GJ will put upwards pressure on the price.

Actual demand for the day was **1 025 TJ**[17].

Demand forecasting

Actual demand on the day was close to the beginning of day (BOD) forecast (1 025 TJ vs 1 024 TJ). However, demand forecasts were revised up by major participants at the 10 am, 2 pm and 6 pm schedules. By 6 pm the price had increased to $9.90/GJ based on a forecast of 1064 TJ of demand, which turned out on the gas day to be 40 TJ higher than actual demand. The market operator also over-forecast demand on this day, indicating a degree of difficulty in forecasting demand, reflected in inaccurate market participant forecasts.

Bids and rebids

Increases to participant demand forecasts throughout the day exceeded increases in injection bid volumes below $6/GJ for each of the associated scheduling intervals, contributing to price increases over the day. For example, injection bids available below $6/GJ increased by 8 TJ at 6 pm, compared to an increase in scheduled demand of 10 TJ. No significant volume of LNG was scheduled for this gas day.

[17] Actual demand refers to the actual daily demand (6 am to 6 am) for comparison with market participants demand forecasts which are submitted at each schedule for a daily period (6am to 6 am).

2 July

For 2 July, Figure V2 shows that demand forecasts and overrides increased the scheduled demand level significantly at the 10 am schedule, increasing the price close to $7/GJ. As forecast demand increased over the day prices continued to rise, before falling below $7/GJ again during the last schedule as AEMO used negative overrides to decrease scheduled volumes from 6 pm.

Figure V2: 2 July gas day information

Schedule	6 am	10 am	2 pm	6 pm	10 pm	Daily weighted price
Price ($/GJ)	5.19	6.53	8.00	9.89	6.53	5.38
Demand forecast (TJ)	1056	1101 (+45)	1106 (+6)	1104 (-2)	1112 (+8)	
AEMO override (TJ)*	0	22	4.4	-9.6	-3.3	
Change in Injection bids <=$8/GJ (TJ)	N/A	-0.3	1.7	12.3	16.5	
Change in withdrawal bids >$8/GJ (TJ)**	N/A	21.2	14.0	0.0	0.0	

*AEMO override is applied to participant's demand forecasts when in accordance with a defined AEMO procedure, the aggregated participant forecasts are considered to be outside a threshold level of accuracy (override is applied based on system security reasons).

**The $8/GJ threshold has been chosen for both injection bids and withdrawal bids as $8/GJ is one of the critical pricing points for determining the schedule price—more injection bids below $8/GJ will put downward pressure on the price; more withdrawal bids above $8/GJ will put upwards pressure on the price.

Actual demand for the day was **1 083 TJ**.

Demand forecasting

Actual demand on the day was around 30 TJ higher than the beginning of day (BOD) forecast. An override by AEMO at 10 am increased demand by an additional 22 TJ on top of increases in aggregate participant forecast volumes. This put upward pressure on price, with the price increasing to $8/GJ for the 2 pm schedule and $9.89/GJ for the 6 pm schedule.

Bids and rebids

The significant increase in demand for the 10 am schedule saw some large participants increase their $0/GJ offers (by up to 64 TJ for one participant). This had minimal impact on prices, with little change to aggregate volumes in bands below $10/GJ.

7 July

On Saturday 7 July, the weighted average imbalance price reached $15.57/GJ (driven by the 6 am price of $16.30/GJ), the highest price since 22 November 2008[18].

Figure V3 shows that prices decreased from the beginning of day schedule, despite increased levels of demand. Prices continued to fall, until stabilising during the last two schedules as linepack levels increased and demand was reduced (explained below under *LNG*).

Figure V3: 7 July gas day information

Schedule	6 am	10 am	2 pm	6 pm	10 pm	Daily weighted price
Price ($/GJ)	16.30	8.51	7.10	4.25	4.25	15.57
Demand forecast (TJ)	1012	1022 (+10)	1026 (+4)	1022 (-5)	1022 (+0)	
AEMO override (TJ)*	0	0	0	0	0	
Change in Injection bids <=$8/GJ (TJ)**	N/A	73.9	-3.9	-8.9	-1.5	
Change in withdrawal bids >$8/GJ (TJ)**	N/A	0.0	-0.5	-2.5	17.2	

*AEMO override is applied to participant's demand forecasts when in accordance with a defined AEMO procedure, the aggregated participant forecasts are considered to be outside a threshold level of accuracy (override is applied based on system security reasons).

**The $8/GJ threshold has been chosen for both injection bids and withdrawal bids as $8/GJ is one of the critical pricing points for determining the schedule price—more injection bids below $8/GJ will put downward pressure on the price; more withdrawal bids above $8/GJ will put upwards pressure on the price.

Actual demand for the day was **1 002 TJ**.

The high 6 am price ($16.30 GJ) on this gas day was a direct result of a supply constraint at Iona which prevented the scheduling of cheaper priced Iona offers (explained below under *LNG*).

Demand forecasting

BOD demand forecasting by larger participants was generally accurate.

Bids and rebids

In response to the high BOD price of $16.30/GJ, for the 10 am schedule, participants rebid capacity into lower prices as shown by the increase of 73.9 TJ in gas bids priced under $8/GJ. This was largely the result of rebidding by one participant, who shifted 40 TJ from above $8/GJ to the floor and added a further 20 TJ priced at zero.

LNG and Iona

A supply point constraint at the Iona facility limited flows to 0 TJ/h through the Iona system injection point until 9 am. As a result of the Iona outage, levels of linepack were being replenished at a lower rate than expected. As a result, (high-priced) LNG was scheduled (in merit order), leading to a high BOD price. Prices for subsequent schedules fell as the linepack was brought back to satisfactory levels.

[18] On this day the imbalance price reached $54.88/GJ (there was a VOLL price ($800/GJ) at 10pm.).